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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,843	01/13/2006	Ola J. Karlsson	003301-250	5512

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EXAMINER	
SALVITTI, MICHAEL A	
ART UNIT	PAPER NUMBER
4131	

NOTIFICATION DATE	DELIVERY MODE
10/20/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary	Application No.	Applicant(s)	
	10/561,843	KARLSSON ET AL.	
	Examiner	Art Unit	
	MICHAEL SALVITTI	4131	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☒ Claim(s) *1-4, 23 and 25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/22/2005* .
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Method for the Emulsion Polymerization of Hydrophobic Monomers Using Dendrimers as Surfactants.

Claim Objections

Claims 1-4, 23 and 25 are objected to because of the following informalities:

In line 2 of each of claims 1-4, the phrase "wherein that" is employed. This phrase is not idiomatic English.

Claim 23 contains the phrase "is present is present"

In claim 25, the word "and" was omitted between binder and "a waterborne".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3 and 12-25 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,534,590 to *Aso et al*.

Aso details an aqueous vinyl copolymer emulsion composition containing a dendrimer.

- As to claims 1-3, 'Example 1' (column 16, lines 20-60) anticipates the dispersion in 'claim 1' of the instant application. The composition described is a waterborne copolymer dispersion (line 43), and contains monomeric units from styrene and n-butyl methacrylate, both of which have a water solubility less than 0.001 g/L (see the attached data sheets from *Yaw's Handbook of Thermodynamic and Phyiscal Properties of Chemical Compounds*). *Aso* uses 10 parts of the dendrimer in the emulsion (column 16, line 31). The polymerization is completed in one stage (column 16, lines 20-60). *Aso* gives no indication of the reaction pressure; however the pressure is likely to be near atmospheric pressure (~1 bar), since the reactions were performed in a flask as opposed to a high-pressure reactor.
- Claim 12: C_{11}-C_{28} acrylates are specified (column 3, line 14);
- Claim 13: C_1-C_{10} acrylates are specified (column 3 lines 2-4);
- Claim 14: unsaturated carboxylic acids are specified (column 4, lines 10-11);
- Claim 15: glycidyl monomers are specified (column 3, lines 43-45);
- Claim 16: monomer units derived from ethylene or propylene (column 4, lines 46-47) are used;
- Claim 17: styrene is a disclosed monomer (column 4, line 24);

- Claim 18: vinyl acetate is a disclosed monomer (column 3, line 15);
- Claim 19: a monomer derived from butadiene is specified (column 4, line 37);
- Claim 20: acrylamide derivatives are shown (column 3, lines 25-30);
- Claim 21: monomer units derived from polyhydric alcohols and acrylic acids are shown (column 4, lines 25-32);
- Claim 22: monomers containing silanes are disclosed (column 3, lines 55-68);
- Claim 23: a chain transfer agent is disclosed(column 13, lines 55-63);
- Claim 24: a surfactant is used (column 12, lines 35-68).

All of the aforementioned embodiments are disclosed by *Aso* as components which can be polymerized with a dendrimer in an aqueous emulsion.

4. As to claim 25, the emulsion product is used as a coating composition (columns 15-19 detail the coating process and observed results).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,534,590 to *Aso et al.* as applied to claim 1 above, and further in view of U.S. Patent No. 5,760,129 to *Lau*.

In U.S. Patent No. 6,534,590, *Aso* teaches aqueous polymerizations with several hydrophobic monomers and incorporating a dendrimer into the reaction, although polymerizations of gaseous monomers were not disclosed.

Aso does not anticipate polymerization of gaseous monomers in his embodiment of the invention.

Lau teaches the polymerizations of gaseous monomers, including ethylene gas (column 4, line 28), through aqueous solubilization with cyclodextrins.

The dendritic polymers proposed by *Aso* share characteristics in common with the cyclodextrins proposed by *Lau.* For instance, the chemical structure in column 10, lines 28-42 of *Aso* shows a dendrimer containing a hydrophobic core comprised of an alkylated biaryl, and hydrophilic termini comprised of metal sulfonate and/or alkylene oxide moieties. The cyclodextrins used by *Lau* contain

a hydrophobic cavity (column 3, lines 8-10) and they contain a hydrophilic shell (an inherent property of β-cyclodextrins, see Figure 3 of C*hem. Rev*. 98 (1998) 1787-1802). It would have been obvious to one of ordinary skill in the art to create a dendrimer containing a hydrophobic core and a hydrophilic exterior that mimics the polarities of a cyclodextrin. This would be done with the motivation of solubilizing a higher concentration of hydrophobic gases in a polar solvent such as water, with the intention of initiating emulsion polymerization.

8. Claims 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,534,590 to *Aso et al.* as applied to claim 1 above, and further in view of WO 93/17060 to *Hult et al*..

Aso teaches dendritic polymers used in emulsion polymerization containing a silylated core. However, the key difference between instant claims 5-11 and *Aso's* patent is the type of dendrimers being used for the emulsion polymerization.

Hult teaches dendritic polyester macromolecules of the type claimed in the instant application, noting that they may be used as a component in emulsions (see claim 22 of '17060). With respect to the claims of the instant application, *Hult* teaches:

- Claim 5: Figure 1 (appendix ½ of *Hult*) shows a hydroxyfunctional dendritic polyester.
- Claim 6: at least two hydroxyl and one carboxyl group are present (figure 1, appendix ½ of *Hult*).

- Claim 7: the polymeric core is built from a reactive monomer containing reactive hydroxyls (figure 1, appendix ½ of *Hult*).
- Claim 8: the disclosed embodiment contains two dendritic generations (figure 1, appendix ½ of *Hult*).
- Claim 9: a claimed embodiment of *Hult* mentions alkoxylates having a molecular weight of 8000 (see claim 2h). An alkoxylate of this size would have approximately 130 repeating units of ethylene glycol. In light of *Hult* (claim 15), which claims two free hydroxyl, the molar ratio of hydroxyl to alkylene oxide is 2 to 130, or ~1:65 which is greater than the claimed 1:40 ratio.
- Claim 10: Figure 1, appendix ½ of *Hult* shows a dendrimer with a chain extender having at least one hydroyl and one carboxyl group.
- Claim 11: *Hult* discloses chain termination by a chain stopper (see claims 20 and 21).

At the time of invention, it would have been obvious to one of ordinary skill in the art to substitute a dendritic polymer similar to those proposed by *Hult*, to incorporate it into the emulsion polymerization method proposed by *Aso.* The motivation behind this action would have been the creation of monomeric dispersions and polymerization end-products with different properties.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- "Dendritic Initiators for "Living" Radical Polyerizations: A Versatile Approach to the Synthesis of Dendritic-Linear Block Copolymers", *J. Am. Chem. Soc.* ***1996***, *118*, 11111-11118 by *Leduc et al*. This publication gives a synthetic procedure for a similar reaction with styrene, however it is an emulsion performed in an anhydrous solvent.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL SALVITTI whose telephone number is (571)270-7341. The examiner can normally be reached on Monday to Friday 8AM to 5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571)272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/
Supervisory Patent Examiner
Art Unit 4131

M.S.